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Scott P M, van Walbeek W, Kennedy B & Anyeti D. Mycotoxins (ochratoxin A, citrinin, and sterigmatocystin) and toxigenic fungi in grains and other agricultural products. *J. Agr. Food Chem.* 20:1103-9, 1972.  
[Food Res. Labs., Health Protection Branch, Dept. Natl. Health and Welfare, Ottawa, Ontario, Canada]

Ochratoxin A was detected in 18 out of 29 samples of heated Saskatchewan grain and citrinin co-occurred in 13 of these samples. *Penicillium viridicatum* Westling was shown to be an important natural source of these mycotoxins. In addition, sterigmatocystin was found in one grain sample. [The SC<sup>1</sup>® indicates that this paper has been cited in over 140 publications, making it one of the five most-cited papers published in this journal to date.]

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"Around 1970, the field of applied mycotoxicology was starting to include mycotoxins other than aflatoxins. So when we received samples of suspect grains and feeds for mycotoxin analysis, we looked for several mycotoxins, using thin-layer chromatography as our detection technique. Many of the samples were associated with death or sickness in farm animals or with lung problems in farmers and grain elevator operators. We began to find ochratoxin A quite frequently and it was decided to make these 'interruptions' in our research program into a project of their own.

"The microbiology research division was just across the corridor from the analytically oriented chemists of the food research division so that collaboration with my colleague there, Mina van Walbeek, was readily possible on a day-to-day basis. Useful techniques that aided in the isolation of toxigenic *Penicillia* are described in our paper. If she isolated fungi that produced citrinin, we would reanalyze those particular samples for this mycotoxin and so demonstrated in several grain samples the natural co-occurrence of ochratoxin A and citrinin, the latter found for the first time in an agricultural commodi-

ty. These results were presented at an International Union of Pure and Applied Chemistry symposium in Kungälv, Sweden, in 1972, and similar Danish findings were announced at the same meeting. We detected the carcinogenic mycotoxin sterigmatocystin in one wheat sample after it was known to harbor a strain of *Aspergillus versicolor* that produced this toxin. This was also the first report of a natural occurrence of sterigmatocystin in a commodity.

"We did not claim to have made an unbiased survey of prairie grains for mycotoxins and toxigenic fungi, nor that we had accounted for any of the medical or veterinary observations. However, we did become familiar with the names of a number of small towns in Saskatchewan. After publication of the research, a newspaper article appeared with dramatic headlines, e.g., 'Mouldy grain can kill you,' but, of course, the grains were not intended for human consumption. The results alerted us, however, to the possibility of mycotoxins occurring in Canadian feeds and foodstuffs and surveys were subsequently carried out by the Health Protection Branch and Agriculture Canada.

"The paper has been cited because several new findings were reported in the one publication (or in its predecessor). It has been cited in the introductions of papers dealing with natural occurrence of ochratoxin A, citrinin, and sterigmatocystin. Authors of a survey of US wheat specifically stated that they included assays for ochratoxin because of our results.<sup>2</sup> Reports on the occurrence of ochratoxin A in grains and other agricultural commodities are now numerous,<sup>3</sup> testimony to the increased importance of this mycotoxin. On the other hand, later reports of natural contamination with citrinin and sterigmatocystin are few.<sup>4</sup> Although the production of ochratoxin A, with or without citrinin, by *Penicillium viridicatum* had been previously reported by our laboratory,<sup>1,5</sup> the 1972 paper is also cited for this reason, probably because the number of toxigenic isolates was now large enough to make the point."

1. Scott P M, van Walbeek W, Harwig J & Fennell D I. Occurrence of a mycotoxin, ochratoxin A, in wheat and isolation of ochratoxin A and citrinin producing strains of *Penicillium viridicatum*. *Can. J. Plant Sci.* 50:583-5, 1970. (Cited 85 times.)
2. Shotwell O L, Goulden M L & Hesselstine C W. Survey of U.S. wheat for ochratoxin and aflatoxin. *J. Assn. Offic. Anal. Chem.* 59:122-4, 1976.
3. Harwig J, Kulper-Goodman T & Scott P M. Microbial food toxicants: ochratoxins. (Rechigl M, Jr., ed.) *CRC handbook of foodborne diseases of biological origin*. Boca Raton, FL: CRC Press, 1983. p. 193-238.
4. Stoloff L. Mycotoxins as potential environmental carcinogens. (Stich H F, ed.) *Carcinogens and mutagens in the environment. Volume 1. Food products*. Boca Raton, FL: CRC Press, 1982. p. 97-120.
5. van Walbeek W, Scott P M, Harwig J & Lawrence J W. *Penicillium viridicatum* Westling: a new source of ochratoxin A. *Can. J. Microbiol.* 15:1281-5, 1969. (Cited 65 times.)